Preparing for GOES-R at the Satellite Proving Ground for Marine, Precipitation and Satellite Analysis

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ABSTRACT

The GOES-R and Joint Polar Satellite System (JPSS) Proving Ground Programs were conceived to demonstrate and familiarize forecasters with the next generation geostationary and polar-orbiting satellite products and capabilities that will be incorporated into NOAA operations. The 2014 satellite product demonstrations at the Weather Prediction Center (WPC), Ocean Prediction Center (OPC), National Hurricane Center (NHC) Tropical Analysis and Forecast Branch (TAFB), and Satellite Analysis Branch (SAB) of the National Environmental Satellite, Data, and Information Service (NESDIS) concentrated on convective applications that address rainfall and marine severe thunderstorm hazards. These pre-operational demonstrations allow forecasters to evaluate proxy and simulated GOES-R and JPSS data and refresh rate in a quasi-operational environment. Forecasters use proxy data from research and operational satellite instruments (GOES, MODIS, VIIRS, SEVIRI, among others), WRF model forecasts, and lightning networks to support their forecast and warning decision making. During product evaluations, forecasters help identify the strengths and limitations of the new GOES-R and JPSS capabilities prior to launch, providing valuable feedback to the product developers. Product developers then can use these evaluations to improve the operational versions.

This presentation focuses on proxy products that introduce the future capabilities of the Advanced Baseline Imager (ABI) and the Geostationary Lightning Mapper (GLM) on GOES-R as well as the current capabilities of the Advanced Technology Microwave Sounder (ATMS) and Visible Infrared Imaging Radiometer Suite (VIIRS) on S-NPP. Multispectral imagery allows forecasters to better analyze phenomena like Saharan dust interaction with tropical cyclones and stratospheric intrusions in the vicinity of strong extratropical cyclones. GOES-14 has provided the unique opportunity to evaluate the operational utility of 1-min super rapid scan imagery. Forecasters can integrate other products with the high resolution imagery for situational awareness at refresh rates that are faster than radar. The Overshooting Top Detection (OTD) algorithm is being demonstrated at the OPC and TAFB to help forecasters locate the most intense convection in the offshore waters where radar is not available. The OTD also is being used to help SAB and WPC forecasters identify potential excessive rainfall areas. A GLD360 lightning density product was developed through coordination between OPC, the Cooperative Institute for Climate and Satellites (CICS), and NESDIS/STAR, in coordination with the Pseudo-Geostationary Lightning Mapper (PGLM) product developed by NASA SPoRT. The GLD360 product is available for 2-min, 5-min, 15-min, and 30-min intervals and helps forecasters to better quantify the intensity of cloud-to-ground lightning activity at the GLM 8 km resolution. Additional products such as the GOES-R Convective Initiation (CI) and Nearcast are becoming more integrated in the forecaster's toolbox. Our presentation will provide animations and feedback on particular events to illustrate product uses and lessons learned.